

PATENT
10/542390

JC17 Rec'd PCT/PTO 13 JUL 2005

1. (Original) An apparatus, comprising:

at least one member configured to mask at least one portion of a target area of skin from an electromagnetic radiation provided by an electromagnetic radiation source, wherein at least one member is configured such that a particular amount of the electromagnetic radiation that impacts the at least one member is reflected in a direction of the electromagnetic radiation source.

2. (Original) The apparatus of claim 1, wherein the target area is a predetermined area of the skin.

3. (Original) The apparatus of claim 1, wherein each of the at least one shielding member is configured to reflect the impacted electromagnetic radiation away from the apparatus.

4. (Currently amended) The apparatus of claim 1, wherein each of the at least one shielding member is configured to absorb a ~~minimal~~ minimal amount of electromagnetic radiation.

5. (Original) The apparatus of claim 1, wherein the electromagnetic radiation is optical radiation.

6. (Original) The apparatus of claim 1, wherein the electromagnetic radiation source is an ablative laser.

7. (Original) The apparatus of claim 1, wherein the electromagnetic radiation source is generated by a carbon dioxide laser.

8. (Original) The filtering apparatus of claim 1, wherein the electromagnetic radiation source is an Er:YAG laser.

9. (Original) The apparatus of claim 1, wherein the at least one shielding member masks at least 0.1% of the target area from the electromagnetic radiation.

10. (Original) The apparatus of claim 1, wherein the at least one member masks at most 90% of the target area from the electromagnetic radiation.

11. (Original) The apparatus of claim 1, wherein the at least one member masks the at least one portion of the target area such that the electromagnetic radiation is prevented from affecting the at least one portion of the target area.

12. (Original) The apparatus of claim 1, wherein the at least one member is at least 50 pm in width and at most 300 μm .

13. (Original) The apparatus of claim 19 wherein the at least one member is configured to define at least one aperture.

14. (Original) The apparatus of claim 13, wherein the at least one aperture has a width of at least 50 μm and at most 1000 μm .

15. (Original) The apparatus of claim 1, wherein the at least one member is cooled.

16. (Original) The apparatus of claim 1, wherein the at least one member is adapted to be cooled to at least 37°C and at most negative 20°C.

17. (Original) The apparatus of claim 1, wherein the at least one member includes at least one channel extending therethrough.

18. (Original) The apparatus of claim 17, wherein the at least one channel is configured to facilitate a cooling agent.

19. (Original) A method for treating dermatological conditions, comprising:

controlling an electromagnetic radiation source to generate an electromagnetic radiation;

causing the electromagnetic radiation to be applied to a target area of skin; and

masking at least one portion of the target area of the skin from the electromagnetic radiation.

20. (Original) The method of claim 19, wherein the masking step is performed using a mask which includes at least one member.

21. (Original) The method of claim 20, wherein the at least one shielding member masks at least 0.1% of the target area from the electromagnetic radiation.

22. (Original) The method of claim 20, wherein the at least one member masks at most 90% of the target area from the electromagnetic radiation.

23. (Original) The method of claim 20, wherein the at least one member masks the at least one portion of the target area such that the electromagnetic radiation is prevented from affecting the at least one portion of the target area.

24. (Original) The method of claim 20, wherein the at least one member masks the at least one portion of the target area such that the electromagnetic radiation has an affect on the at least one portion than an affect to other portions of the target area.

25. (Original) The method of claim 20, wherein the at least one member is at least 50 μm in width and at most 300 μm .

26. (Original) The method of claim 20, wherein the at least one member is configured to define at least one aperture.

27. (Original) The method of claim 26, wherein the at least one aperture has a width of at least 50 μm and at most 1000 μm .

28. (Original) The method of claim 20, wherein the at least one member is cooled.

29. (Original) The method of claim 20, wherein the at least one member is adapted to be cooled to at least 37°C and at most negative 20°C.

30. (Original) The method of claim 20, wherein the at least one member includes at least one channel extending therethrough.

31. (Original) The method of claim 30, wherein the at least one channel is configured to facilitate a cooling agent.

32. (Original) The method of claim 19, wherein the mask is configured to reflect a predetermined amount of the electromagnetic radiation in a direction of the electromagnetic radiation source.

33. (Original) The method of claim 19, wherein the mask is configured to reflect the electromagnetic radiation away from the electromagnetic radiation source.

34. (Original) The method of claim 19, wherein the mask is configured to diffuse the electromagnetic radiation.

35. (Currently amended) The method of claim 19, ~~wherein~~ wherein the electromagnetic radiation has a particular wavelength.

36. (Original) The method of claim 35, wherein a surface of the mask has a microstructure having a periodicity approximately in the range of the particular wavelength.

37. (Original) The method of claim 19, wherein the mask is configured to absorb a predetermined amount of the electromagnetic radiation.

38. (Original) The method of claim 19, wherein the electromagnetic radiation source is an ablative laser.

39. (Original) The method of claim 19, wherein the electromagnetic radiation source is a carbon dioxide laser.

40. (Original) The method of claim 19, wherein the electromagnetic radiation source is a Er:YAG laser.

41. (Original) The method of claim 19, further comprising the steps of:

controlling a further electromagnetic radiation source to generate a further electromagnetic radiation; and

applying the further electromagnetic radiation to the target area of the skin.

42. (Original) The method of claim 41, wherein the further electromagnetic radiation source is substantially the same as the electromagnetic radiation source.

43. (Original) The method of claim 41, wherein the further electromagnetic radiation source is different than the electromagnetic radiation source.

44. (Original) The method of claim 41, wherein the further electromagnetic radiation source is one of a Q-switched ruby laser, a Nd:YAG laser, a KTP laser and an Alexandrite laser.

45. (Original) The method of claim 19, further comprising the step of introducing a substance to the target area, wherein the substance is one of growth factors, collagen byproducts, collagen precursors, hyaluronic acid, vitamins, antioxidants, amino acids and supplemental minerals.

46. (Original) An apparatus for treating dermatological conditions, comprising:
a delivery module configured to direct an electromagnetic radiation generated by an electromagnetic radiation source to a target area of skin; and
a mask including at least one member configured to mask at least one portion of the target area of the skin from the electromagnetic radiation.

47. (Original) The apparatus of claim 46, wherein the at least one member is configured to reflect a predetermined amount of the electromagnetic radiation in the direction of the electromagnetic radiation source.

48. (Original) The apparatus of claim 46, wherein each of the at least one member is configured to reflect the electromagnetic radiation away from the electromagnetic radiation source.

49. (Original) The apparatus of claim 46, wherein each of the at least one member is configured to diffuse the electromagnetic radiation.

50. (Original) The apparatus of claim 46, wherein the electromagnetic radiation has a particular wavelength.

51. (Original) The apparatus of claim 50, wherein each of the at least one member includes a microstructure having a periodicity in the range of the particular wavelength.

52. (Original) The apparatus of claim 46, wherein each of the at least one member is configured to absorb a minimal amount of the electromagnetic radiation.

53. (Original) The apparatus of claim 46, wherein the electromagnetic radiation source is an ablative laser.

54. (Original) The apparatus of claim 46, wherein the electromagnetic radiation source is a carbon dioxide laser.

55. (Original) The apparatus of claim 46, wherein the electromagnetic radiation source is a Er:YAG laser.

56. The apparatus of claim 46, wherein the at least one shielding member masks at least 0.1% of the target area from the electromagnetic radiation.

57. (Original) The apparatus of claim 46, wherein the at least one member masks at most 90% of the target area from the electromagnetic radiation.

58. (Original) The apparatus of claim 46, wherein the at least one member masks the at least one portion of the target area such that the electromagnetic radiation is prevented from affecting the at least one portion of the target area.

59. (Original) The apparatus of claim 46, wherein the at least one member masks the at least one portion of the target area such that the electromagnetic radiation is prevented from affecting the at least one portion of the target area.

60. (Original) The apparatus of claim 46, further comprising a case having an aperture formed in a sidewall of the case, wherein the case contains the electromagnetic radiation source and the delivery module, and wherein the at least one member is in registration with the aperture.

61. (Original) The apparatus of claim 46, wherein the delivery module includes a beam collimator.

62. (Original) The apparatus of claim 46, wherein the delivery module includes optical components.

63. (Original) An apparatus for treating dermatological conditions, comprising:

a delivery module configured to direct electromagnetic radiation generated by an electromagnetic radiation source to a predetermined area within a target area of skin, wherein the predetermined area is located in a location relative to the delivery module, and wherein the electromagnetic radiation is adapted to cause thermal damage to epidermal tissue and dermal tissue of the predetermined area within the target area of the skin; and

a translator capable of moving the delivery module, such that the delivery module targets a plurality of spatially separated individual exposure areas of the predetermined area.

64. (Original) The apparatus of claim 63, wherein the electromagnetic radiation source is an ablative laser.

65. (Original) The apparatus of claim 63, wherein the electromagnetic radiation source is one of a diode laser, a fiber laser, a solid state laser and a gas laser.

66. (Original) The apparatus of claim 63, further comprising a case having an aperture formed in a sidewall of the case, wherein the case contains the electromagnetic radiation source, the delivery module and the translator.

67. (Original) The apparatus of claim 66, further comprising a transparent plate in registration with the aperture, wherein the transparent plate seals the case.

68. (Original) The apparatus of claim 67, wherein the electromagnetic radiation has a particular wavelength.

69. (Original) The apparatus of claim 68, wherein the transparent plate absorbs a predetermined amount of the electromagnetic radiation at the particular wavelength.

70. (Currently amended) The apparatus of claim 67, wherein the transparent plate is cooled to provide an aesthetic ~~asthetic~~ affect to the target area of the skin.

71. (Original) The apparatus of claim 67, wherein the transparent plate is configured to be cooled to at least 37°C and at most negative 20°C.

72. (Original) The apparatus of claim 63, wherein the delivery module includes a beam collimator.

73. (Original) The apparatus of claim 63, wherein the delivery module includes optical components.

74. (Original) The apparatus of claim 63, wherein the dermal tissue of the skin of the plurality of spatially separated individual exposure areas is damaged down to a predetermined depth thereof.

75. (Original) The apparatus of claim 63, wherein the plurality of spatially separated individual exposure areas cover at least five percent of the target area and at most sixty percent of the target area.

76. (Original) The apparatus of claim 63, wherein an average distance between each of the plurality of spatially separated individual exposure areas is at least 10 μm and at most 2000 μm .

77. (Original) The apparatus of claim 63 wherein each of the plurality of spatially separated individual exposure areas have a diameter of approximately 0.1 mm.

79. (Original) The apparatus of claim 63, wherein each of the plurality of spatially separated individual exposure areas have a lateral diameter of a smallest dimension of at least 1 μm and at most 500 μm .

79. (Original) The apparatus of claim 63, further comprising an optically transparent plate disposed between delivery module and the target area of the skin.

80. (Original) The apparatus of claim 79, wherein the optically transparent plate is cooled.

81. (Original) The apparatus of claim 79, wherein the optically transparent plate cooled to at least 37°C and at most negative 20°C.

82. (Original) The apparatus of claim 63, wherein a first one of the plurality of spatially separated individual exposure areas is separated from a second one of the plurality of spatially separated individual exposure areas.

83. (Original) The apparatus of claim 82, wherein the first one of the plurality of spatially separated individual exposure areas is separated from the second one of the plurality of spatially separated individual exposure areas by non-irradiated skin section.

84. (Original) The apparatus of claim 63, wherein a first one of the plurality of spatially separated individual exposure areas is exposed to electromagnetic radiation associated with a first set of parameters and a second one of the plurality of spatially separated individual exposure areas is exposed to electromagnetic radiation associated with a second set of parameters.

85. (Original) The apparatus of claim 63, wherein at least two of the individual exposure areas are separated from one another by an unaffected area.

86. (Original) The apparatus of claim 85, wherein the at least two of the individual exposure areas are separated from one another by at least approximately 125 μm .

87. (Original) The apparatus of claim 85, wherein the at least two of the individual exposure areas are separated from one another by at most approximately 500 μm .

88. (Original) The apparatus of claim 63, wherein one of at least one hundred of the individual exposure areas within an area of a square centimeter is separated from another one of the at least one hundred of the individual exposure areas by an unaffected area.

89. (Original) The apparatus of claim 63, wherein one of at least one thousand of the individual exposure areas within an area of a square centimeter is separated from another one of the at least one thousand of the individual exposure areas by an unaffected area.

90. (Original) A method for treating dermatological conditions, comprising the steps of:

(a) controlling an electromagnetic radiation source to generate first and second electromagnetic radiation;

(b) causing a first electromagnetic radiation to be applied to a first individual exposure area of a plurality of spatially separated individual exposure areas of a target area of skin, wherein epidermal tissue and dermal tissue of the first individual exposure area are thermally damaged; and

(c) causing a second electromagnetic radiation to be applied to a second individual exposure area of a plurality of spatially separated individual exposure areas of the target area of the skin, wherein epidermal tissue and dermal tissue of the second individual exposure area are thermally damaged, wherein the first electromagnetic radiation is one of the same as and different from the second electromagnetic radiation, and wherein the first and second individual exposure areas are separated from one another by an unaffected area.

91. (Original) The method of claim 90, wherein the target area has a surface area of approximately 1 cm^2 .

92. (Original) The method of claim 90, wherein the electromagnetic radiation source is an ablative laser.

93. (Original) The method of claim 90, wherein the electromagnetic radiation source is one of a diode laser, a fiber laser, a solid state laser and a gas laser.

94. (Original) The method of claim 90, wherein the dermal tissue of the skin of the plurality of spatially separated individual exposure areas is damaged down to a predetermined depth thereof.

95. (Currently amended) The method of claim 90, wherein the plurality of spatially separated individual exposure areas cover at least twenty percent of the target area and at most forty ~~forty~~ percent of the target area.

96. (Original) The method of claim 90, wherein an average distance between each of the plurality of spatially separated individual exposure areas is at least approximately 10 um and at most approximately 2000 um .

97. (Original) The method of claim 90, wherein each of the plurality of spatially separated individual exposure areas have a diameter of approximately 0.1 mm .

98. (Original) The method of claim 90, wherein each of the plurality of spatially separated individual exposure areas have a lateral diameter of a smallest dimension of at least approximately 1 μm and at most approximately 500 μm .

99. (Original) The method of claim 90, further comprising the step of:

(d) placing an optically transparent plate in registration with the target area.

100. (Original) The method of claim 99, wherein the optically transparent plate is cooled.

101. (Original) The method of claim 99, wherein the optically transparent plate cooled to at least approximately 37°C and at most approximately negative 20°C.

102. (Original) The method of claim 90, wherein the first individual exposure area is separated from a second individual exposure area.

103. (Original) The method of claim 90, wherein the first individual exposure area is separated from the second individual exposure area by non-irradiated skin.

104. (Currently amended) The method of claim 90, wherein the first electromagnetic radiation is associated with a first set of parameters, and wherein the second electromagnetic radiation is associated with a second set of parameters.

105. (Original) The method of claim 90, wherein at least two of the individual exposure areas are separated from one another by an unaffected area.

106. (Original) The method of claim 105, wherein the at least two of the individual exposure areas are separated from one another by at least approximately 125 μm .

107. (Original) The method of claim 105, wherein the at least two of the individual exposure areas are separated from one another by at most approximately 500 μm .

108. (Original) The method of claim 90, wherein one of at least one hundred of the individual exposure areas within an area of a square centimeter is separated from another one of the at least one hundred of the individual exposure areas by an unaffected area.

109. (Original) The method of claim 90, wherein one of at least one thousand of the individual exposure areas within an area of a square centimeter is separated from another one of the at least one thousand of the individual exposure areas by an unaffected area.

110. (New) An apparatus for treating dermatological conditions, comprising:

 a first arrangement capable of providing at least one electro-magnetic radiation which is configured to be usable on a target area of an anatomical structure; and

 a second arrangement capable of directing at least one first radiation of the at least one electro-magnetic radiation to a first location of the target area, and at least one second radiation of the at least one electro-magnetic radiation to a second location of the target area,

 wherein the first and second locations are provided at a distance from one another of approximately between at least 10 μm and at most 2 mm.

111. (New) The apparatus according to claim 110, further comprising:

a third arrangement which is capable of assisting in obtaining a relative velocity information between the target area and the first arrangement, wherein the velocity information is usable by the second arrangement.

112. (New) The apparatus according to claim 110, wherein the second arrangement is further capable of separating the electromagnetic radiation into the at least one first radiation and the at least one second radiation.